667.6

"R. I. W." TOXEMENT

(PATENTED)

Integral Water-proofing *for* Concrete, Stucco *and* Cement Mortar

TOCH BROTHERS

Established 1848

Division of Standard Varnish Works

Technical Paints and Waterproofing Compounds

443 FOURTH AVENUE, NEW YORK

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TOCH BROTHERS, Inc.
NEW YORK, N. Y.

JAN 19 '27

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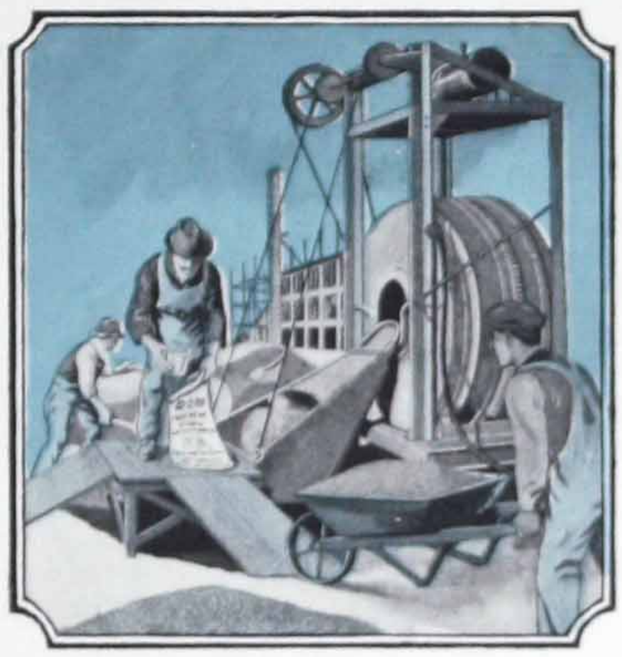

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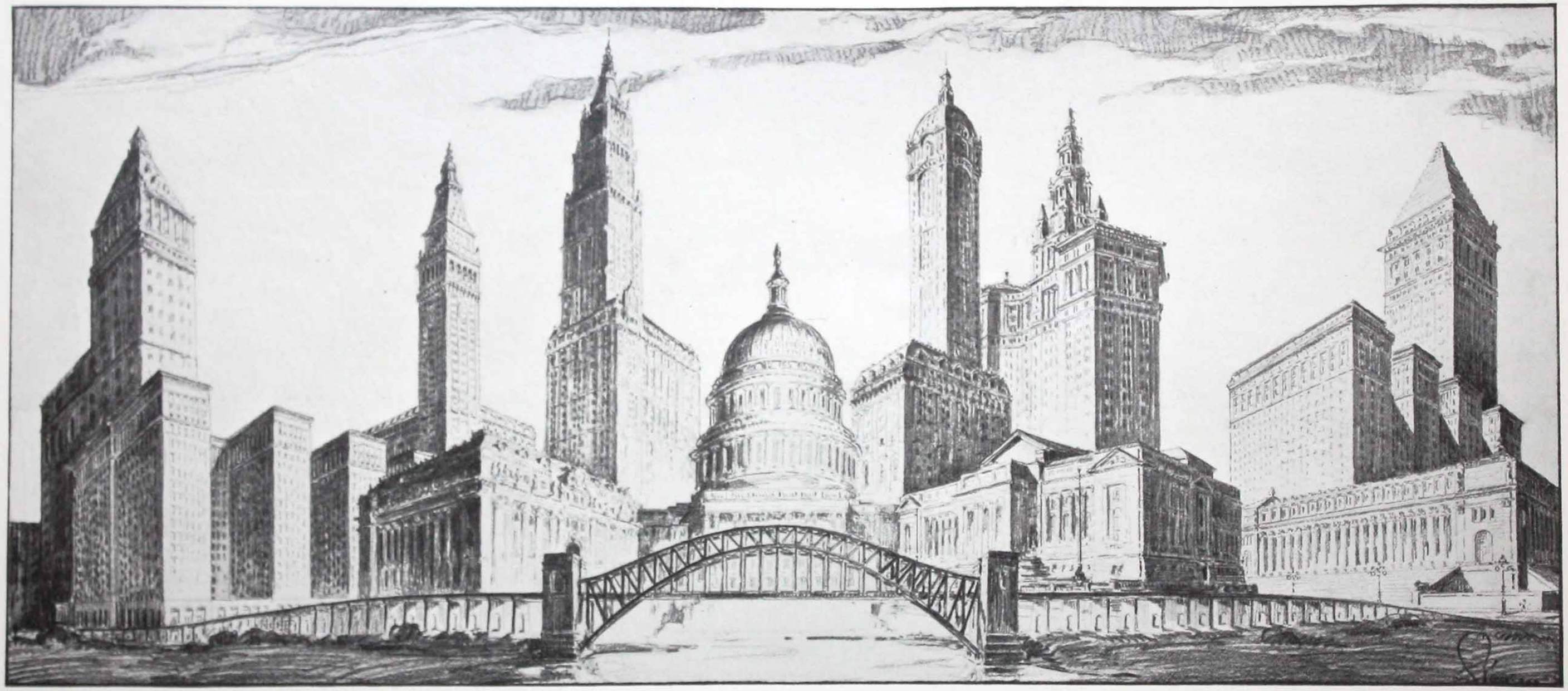
TOCH CITY



Union Central Life
Cincinnati, Ohio

General Motors Co.
Detroit, Mich.

Metropolitan Tower
New York

U. S. Custom House
New York

Woolworth Bldg.
New York

Capitol
Washington, D. C.

Hell Gate Bridge
New York

Singer Bldg.
New York

Public Library
New York

Municipal Bldg.
New York

Hotel Pennsylvania
New York

Bankers Trust Co.
New York

Post Office
Eighth Ave., New York

THE AUTHORITY OF ACCOMPLISHMENT

We have grouped herein some of the more prominent structures protected and preserved with Toch's "R. I. W." Paints and Compounds. The group is graphic evidence of the bigness of Toch accomplishment, and we have, therefore, taken the liberty of naming the composite picture—Toch City.

Toch Brothers

ESTABLISHED 1848

"R. I. W." TOXEMENT*

Integral Waterproofing for Concrete, Stucco and Cement Mortar

"CONCRETE for Permanence" is a slogan that is widely used in the portland cement industry, but permanence cannot be obtained if water is allowed to enter the pores of concrete, cement mortar and stucco in winter and freeze, or to corrode reinforcing rods or embedded steel, thereby causing cracks which may threaten the life of the structure or mar its appearance by efflorescence or other disfigurements.

"Permanence" can be obtained if proper precautions are taken at the outset to obtain concrete, cement mortar and stucco through which water cannot penetrate. A properly designed and constructed building or other structure can be made to withstand the ravages of time and the elements by the addition of "R. I. W." Toxement, the integral waterproofing compound, to the concrete, cement mortar or stucco, or by means of one of the "R. I. W." Protective Products applied to the surface.

This bulletin describes "R. I. W." Toxement, the integral waterproofing compound which adds to the cementitious power of the mineral substance of the mixture, is a true colloid in its composition, and is made in three forms, each for a particular purpose, as described in the following pages.

Porosity of Concrete and the Importance of its Elimination

Reduced to its most practical form, the question of the waterproofing of concrete, or rendering it impervious to the percolation of water, is simply whether or not concrete can be made non-porous, and if so, what is the simplest, most effective and cheapest method of doing it.

Heretofore, porosity has been considered primarily from the waterproofing standpoint—preventing the passage of water through the concrete to the materials or space enclosed. The constant cracking, checking, spalling, disintegration and discoloration of concrete structures have, however, emphasized most emphatically that this is but part of the problem.

Careful study and investigation have disclosed conclusively that such deterioration is caused by the entrance into the pores of moisture or water laden with acid or alkaline influences which react with the free lime always present in the concrete.

In reinforced concrete, these conditions are even more important because, aside from any direct disintegration of the concrete itself, the corrosion of the steel has to be considered. This is always accompanied by an increase in molecular volume and a swelling action sufficiently powerful to break the concrete. These fissures permit the entrance of further moisture, and a rapidly progressive disintegration results.

The vital importance of eliminating porosity has thus become increasingly evident as time and experience have revealed the possibilities and impossibilities of concrete as a structural material.

If concrete is to be permanent it must be non-porous, and its permanence will be directly proportional to its non-porosity.

* Patented.

Danger of Excess Mixing Water

Much study and investigation have been carried on to determine the true value and relation of the various elements which have been shown to enter into the problem—such as proportion of aggregates, grading, mixing, curing and placing—but recent exhaustive experiments have shown emphatically that the prime cause of defective concrete, both as regards density and strength, is the use of excess mixing water. All water which is not absorbed in the hydrolysis of the cement, must occupy its volumetric space in the concrete while setting, and when it evaporates during the process of drying, it must leave a void, or pore.

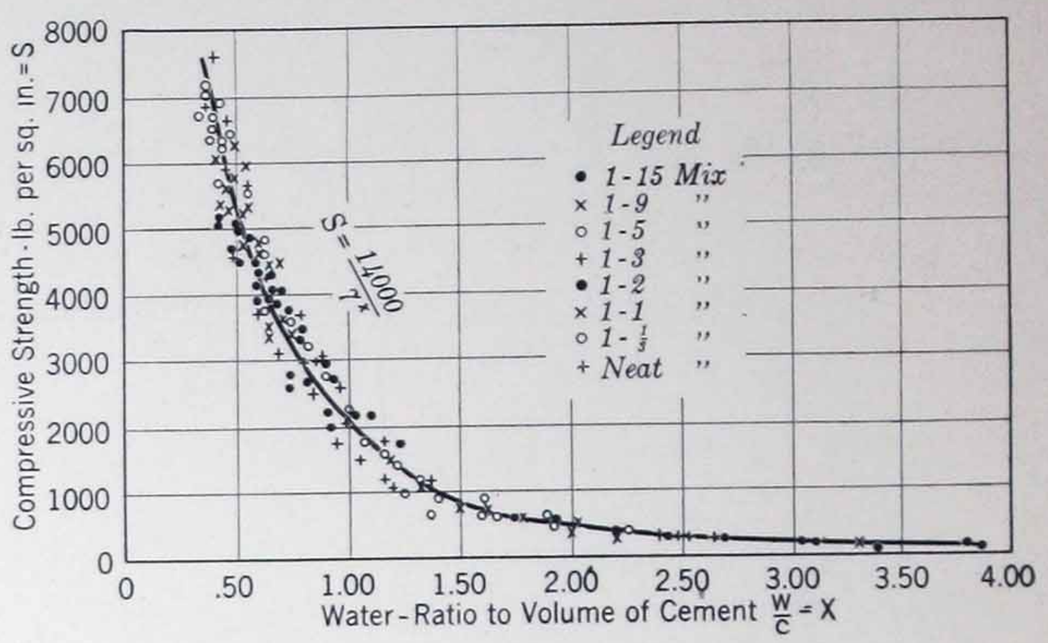


Figure No. 2

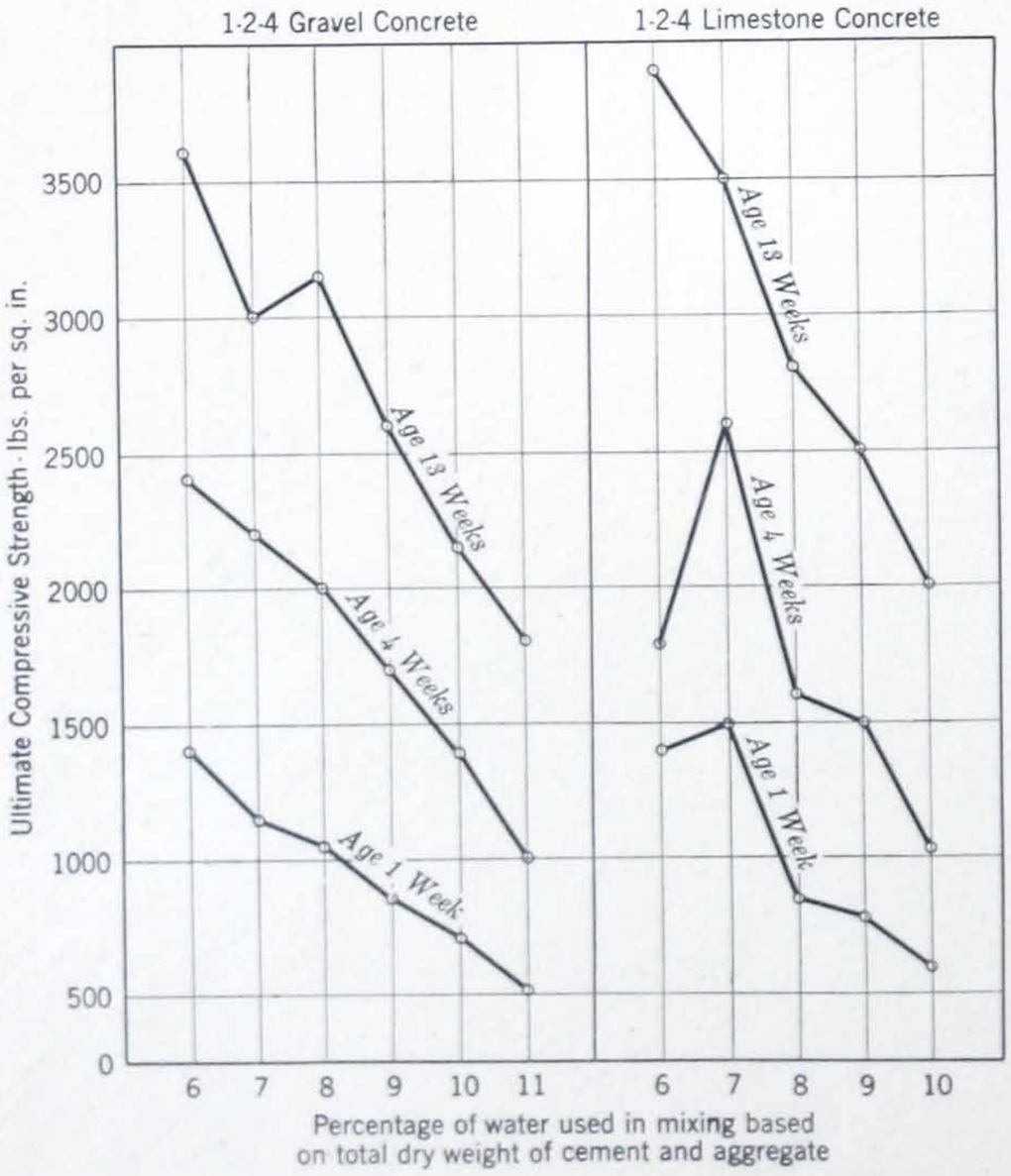


Figure No. 1

Technologic Paper No. 58 of the Bureau of Standards has presented the curve reproduced in Figure No. 1, showing the effect of excess mixing water on the strength (and therefore density) of 1:2:4 concrete, and says:

"The compressive strength of concrete may be reduced by the use of excess mixing water to a fractional part of that which it should attain with the same materials."

Bulletin No. 1 of the Structural Materials Research Laboratory, Lewis Institute, Chicago, illustrates forcibly the same fact, as is shown in the curve reproduced in figure No. 2, based on thousands of experiments, and states:

"With given concrete materials and conditions of test, the quantity of mixing water used determines the strength of the concrete so long as the mix is of a workable plasticity."

"In certain instances a 1:9 mix is as strong as a 1:2 mix, depending only on water content."

"Use the smallest quantity of mixing water that will produce a plastic or workable concrete."

In actual field work, excess water gives rise to other defects and troubles. In sloppy mixes, particularly if chuted from steep angles, or dumped, the stone sinks through the mortar, and segregation and stratification occur with accompanying varying strength values and consequent tendency to crack. Excess water also causes the lighter elements of the cement to float to the surface, out of the body of the concrete, where their cementitious and void-filling properties would be of value, and produce the always troublesome laitance seams.

There is but one reason for using superfluous mixing water, and that is to obtain workability, plasticity and flowability, and thus lessen the labor and cheapen the cost of placing—a temptation that is inevitably ever present. It is obvious that in dry mixes friction tends to prevent the settlement of the particles into a compact mass or confined spaces without considerable extraneous assistance of some sort.

In the June 12, 1919, issue of the "Engineering News-Record," Messrs. Williams and Davis of the United States Bureau of Standards, discussing the experiments conducted by them, illustrating the pernicious effects of excess water, state, however, that:

"Whatever the brand or quantity of cement, whatever the type, whatever the physical condition, or quantity of aggregate, flowability of the concrete must be considered first and last, as of fundamental importance."

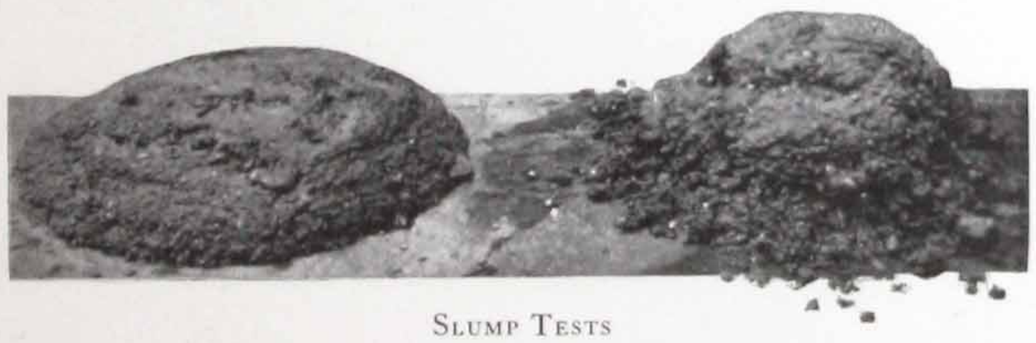
Correction of Porosity

Flowability is of fundamental importance and consequently it is quite evident that if flowability, workability and plasticity can be obtained without the use of excess mixing water, both the necessity and desire for its use are automatically eliminated, and a vast improvement immediately results in the texture and strength of the concrete.

Flowability, workability and plasticity can be obtained otherwise than through the use of excess mixing water. These desirable properties can be simply, quickly and economically obtained through the use of "R. I. W." Toxement.

"R. I. W." Toxement is an integral waterproofing material possessing pronounced lubricating qualities. It is a gray powder, the addition of which to the aggregates in an amount equal to 2 per cent. of the portland cement used, will increase in a remarkable degree the workability, plasticity and flowability of the concrete. This lubricating effect decreases the friction between the particles, causes them to settle into a denser mass, enables the concrete to slide more easily into confined spaces in the forms, decreases the necessity for extreme tamping and vertical chuting, and thus reduces porosity.

Furthermore, for given proportions and time of mixing a desired plasticity can be obtained with less mixing water when "R. I. W." Toxement is used; hence an automatic restriction is placed on the primal cause of porosity and weakness.



SLUMP TESTS

Comparative slump tests of "Toxemented" and "Non-Toxemented" batches of concrete mixed 1:2:4. The conditions of the test were identical in each instance. The time of mixing and the amount of water were exactly the same for each batch.

As fundamentally important, however, as this lubricating action is, it is not by any means the sum total of the pore-closing and waterproofing effect of "R. I. W." Toxement. Other actions occur which are more complicated. One of the most effective of these can be most briefly described as the promotion of the hydration of the cement. It is a well known fact that but a small part of the cement used is actually hydrated in concrete as usually manipulated; some investigators say not more than 25 or 30 per cent.

These latent elements are, however, capable of hydration under the proper circumstances. They hydrate with an amorphous texture and have great cementitious value. It is obvious that if otherwise excess water can be absorbed in this action, the vacant space it would leave on evaporation will be filled with solid cementitious material, inherent porosity further reduced, and the quality of the concrete improved. Toxement induces this action.

It will thus be seen that by means of these two effects alone, when "R. I. W." Toxement is incorporated in the concrete an element has been introduced which conduces to the elimination of porosity and the perfection of the texture of the concrete through means which are entirely normal and in entire accord with the natural functioning of the other ingredients.

AMERICAN RADIATOR BUILDING, NEW YORK, N. Y.

RAYMOND M. HOOD, *Architect*

HEGEMAN-HARRIS CO., *Contractors*

"R. I. W." Edinburgh Black Mortar Color brings out the unusual color effect of this black brick office building. Gold leaf applied over "R. I. W." Liquid Konkerit on the stone trimmings lends beauty to the structure. "R. I. W." Toxement used in all mortar joints to make the mortar waterproof and plastic; "R. I. W." Quick-Done was added to accelerate the setting time and lower the freezing point.

Factors to be Avoided

In the addition to concrete, however, of any such integral material, great care should be exercised to avoid the introduction of any deleterious reactions that might more than offset any benefit that would accrue. The following restrictions should certainly maintain:

First—Obviously, the waterproofing must not be added in such quantity or manner as to necessitate the addition of even more mixing water. The addition of an appreciable per cent., say, 10 to 15, of finely divided inert material, would require considerable additional mixing water merely to wet it, and this water, not being chemically used, would eventually evaporate and leave its space.

"R. I. W." Toxement is added in the small quantity of approximately 2 per cent. of the amount of portland cement used.

Second—The addition of an integral waterproofing compound should not increase or complicate the conditions of workmanship.

"R. I. W." Toxement is a powder. A two-pound measure full is simply thrown in the mix each time a 94-pound bag of portland cement is added.

Third—The material must not increase the chemical susceptibility of the concrete. Tests made by the Bureau of Standards have shown that it is the free lime always present in concrete that is attacked by acid, saline and alkaline influences. If a lubricant containing more lime were used, these actions would naturally be increased.

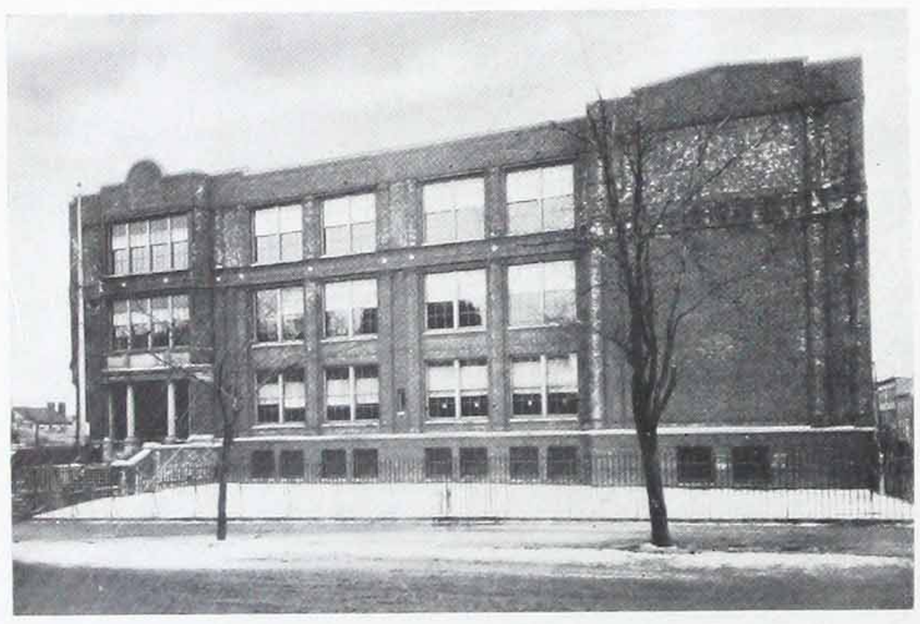
"R. I. W." Toxement does not increase the chemical susceptibility of concrete.

Fourth—The material must not interfere with the proper hydration of the cement through water repellent qualities or in any other way.

"R. I. W." Toxement assists the hydration of portland cement.

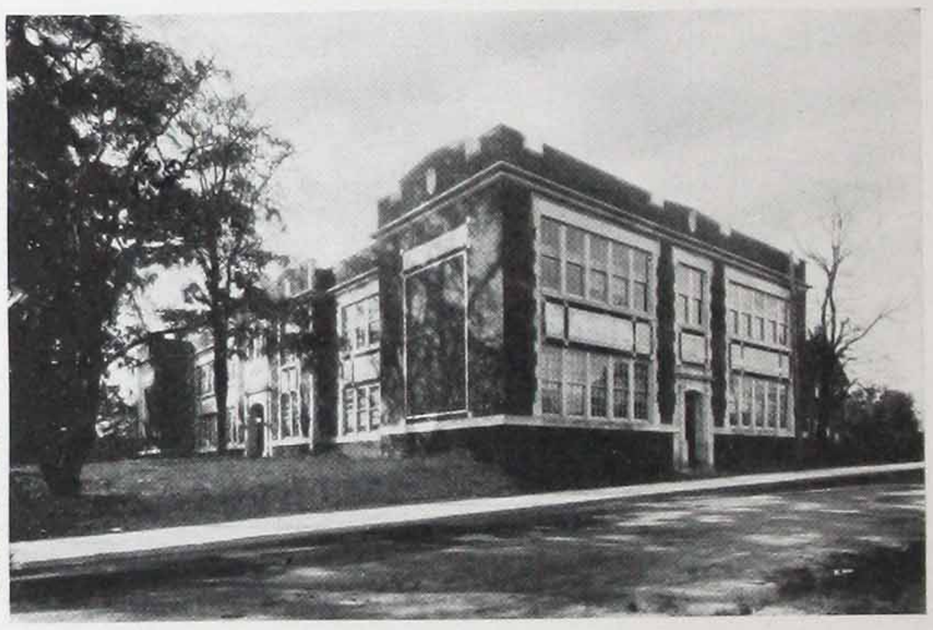
"R. I. W." Toxement, in powder form, is recommended for waterproofing concrete construction of varied types, including bridges, viaducts, dams, piers, dry docks, swimming pools, factories, office buildings, foundations, walls, floors, elevator and boiler pits; also moulded cement work such as urns, balustrades, statues, benches and posts.

Note: For the waterproofing of stucco and cement mortar "R. I. W." Toxement Paste is recommended. A description of this material and specifications covering its use will be found on page 9.



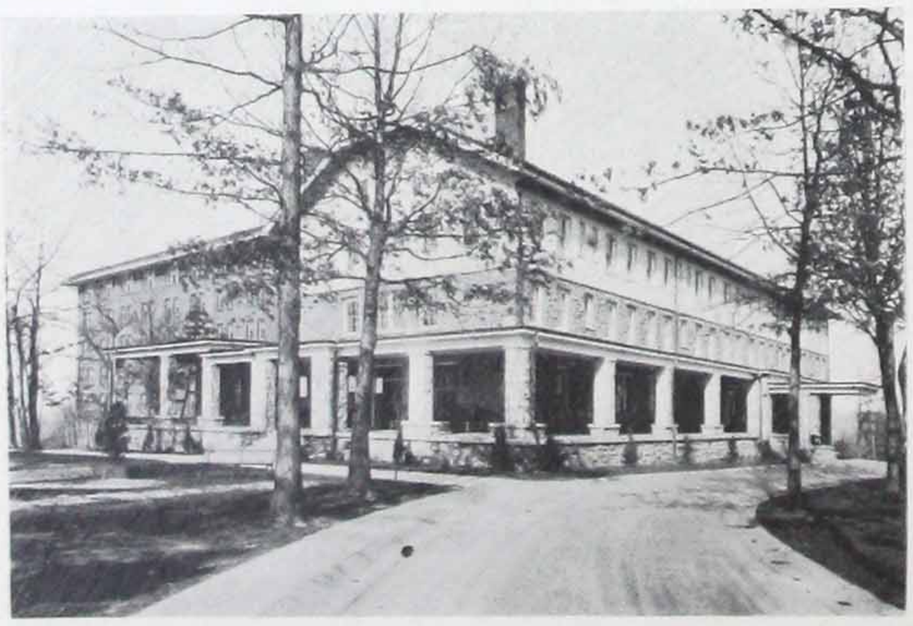
Left
WEBSTER STREET SCHOOL, NEWARK, N. J.
Guilbert & Betelle, *Architects*

Right
THOMPSON SCHOOL, RALEIGH, N. C.
G. Gadsden Sayre *Architect*



Concrete waterproofed with "R. I. W." Toxement, the integral waterproofing compound for foundations, elevator and boiler pits, bridges, piers and other mass concrete construction.

"R. I. W." Toxement Paste and No. 232 "R. I. W." protect the walls against the penetration of dampness. "R. I. W." Flintox preserves floors from dusting and abrasion.



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SIGNAL MOUNTAIN HOTEL, CHATTANOOGA, TENN.
J. D. Alsup, *Architect*

Right
STANDARD OIL CO., WICHITA, KANSAS

Cement floors, inside and outside walls and concrete basement of this famous tourist hotel, one of the show-places of the South, waterproofed with "R. I. W." Toxement.

All concrete waterproofed with "R. I. W." Toxement, the integral waterproofing compound which increases the workability, flowability and plasticity of concrete, stucco and cement mortar.

Specifications

For the Integral Waterproofing of Concrete With "R. I. W." TOXEMENT (A Gray Powder)

(a) **General:**

All concrete construction including (mention work to be waterproofed) shall be waterproofed throughout by the use of "R. I. W." Toxement (patented) as manufactured by and in accordance with the direction of Toch Brothers, Inc., New York, N. Y.

(b) **Hand Mixing:**

Dry sand shall be spread in a layer of even depth on a level, water-tight platform and the portland cement spread thereon. Over the portland cement sprinkle "R. I. W." Toxement in the proportion of two per cent., by weight, of the cement used. These materials shall be turned until they are evenly mixed. To this mixture shall be added (here the architect or engineer will specify the balance of the aggregate and the method of completing the mixture.)

(c) **Machine Mixing:**

Use "R. I. W." Toxement in the proportion of two per cent., by weight, of the cement used. Add the "R. I. W." Toxement to the neat portland cement at the mixer or by dumping it into the bag of cement before it is dumped into the hopper, then proceed in the usual manner (here the architect or engineer will specify the balance of the aggregate and the method of completing the mixture.

(d) **Placing:**

Concrete floors shall be kept wet at least two weeks during time of curing to insure the proper crystallization of the cement. All concrete work shall be protected against frost. Make tight joints by using "R. I. W." Toxement Bonding Coat immediately before placing additional concrete. Joints twenty-four hours old or more shall be broom-swept free of dirt and wet down thoroughly before the "R. I. W." Toxement Bonding Coat is applied.

(e) **Bonding Coat:**

Thoroughly wet down the surface; then apply the "R. I. W." Toxement Bonding Coat, which shall be made of five pounds of "R. I. W." Toxement and one bag of neat portland cement, thinned down with clean water (about six gallons) to the consistency of a thick paint, then follow with concrete or cement plaster coat. Do not apply more wash than will remain wet until covered.

NOTE: To facilitate computation a bag of portland cement is assumed to weigh 100 pounds; therefore, "R. I. W." Toxement should be used in the proportion of two pounds to every bag of portland cement.

On page 11 will be found tables showing the approximate quantities of "R. I. W." Toxement, neat portland cement, fine and coarse aggregates required for one cubic yard of compact cement mortar or concrete and for varying thicknesses of cement mortar and concrete, no allowance being made for waste.

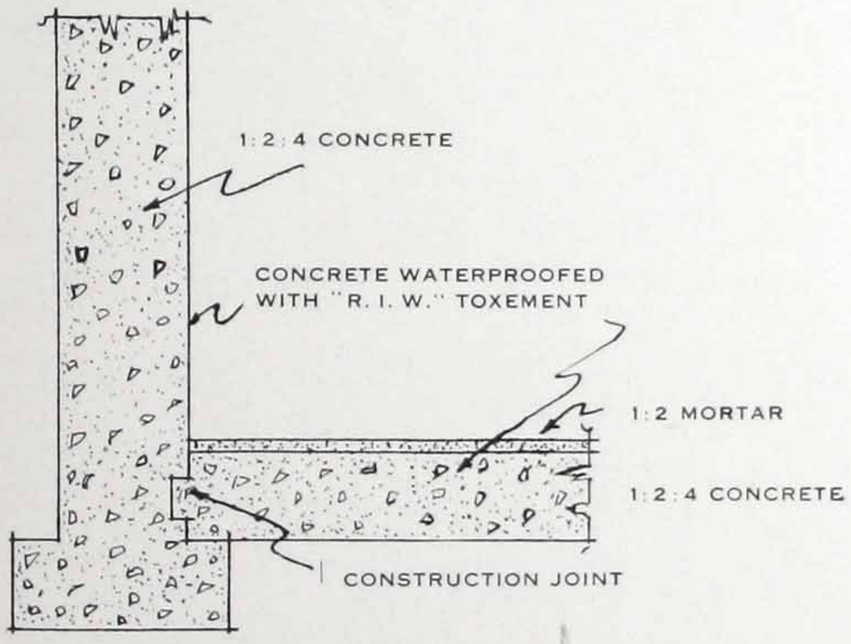


FIGURE 1

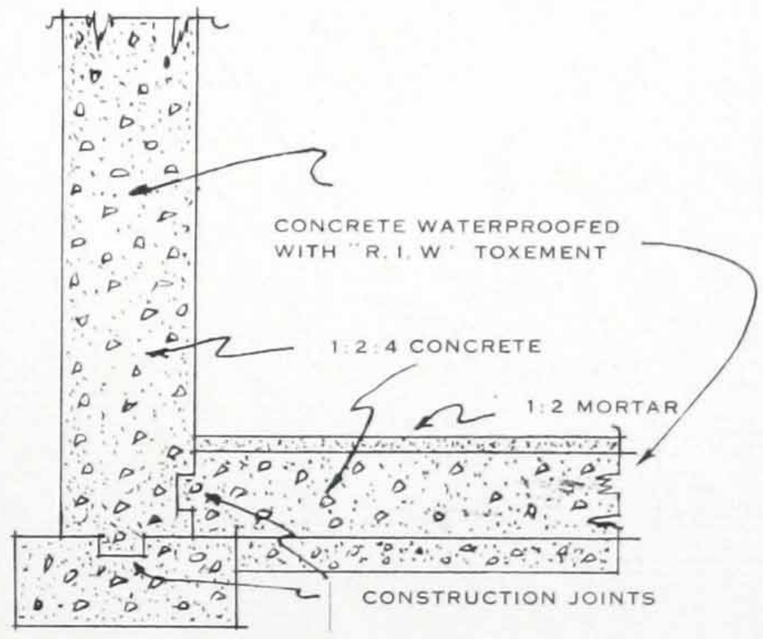


FIGURE 2

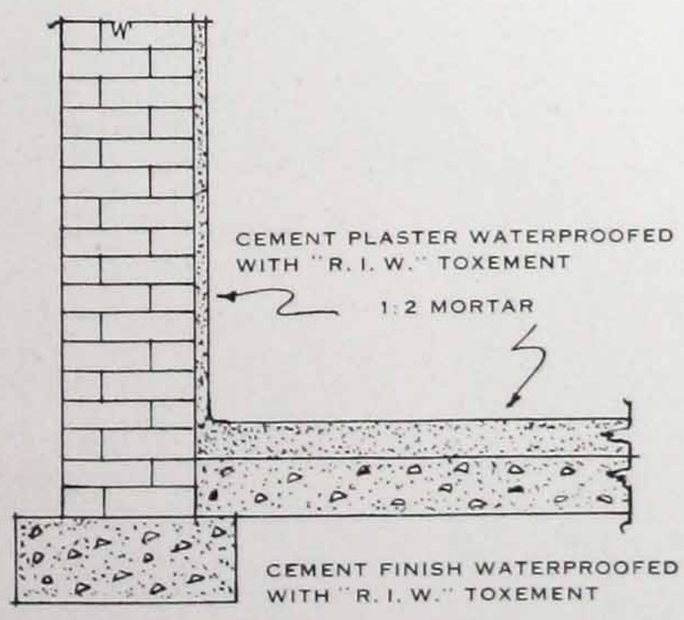


FIGURE 3

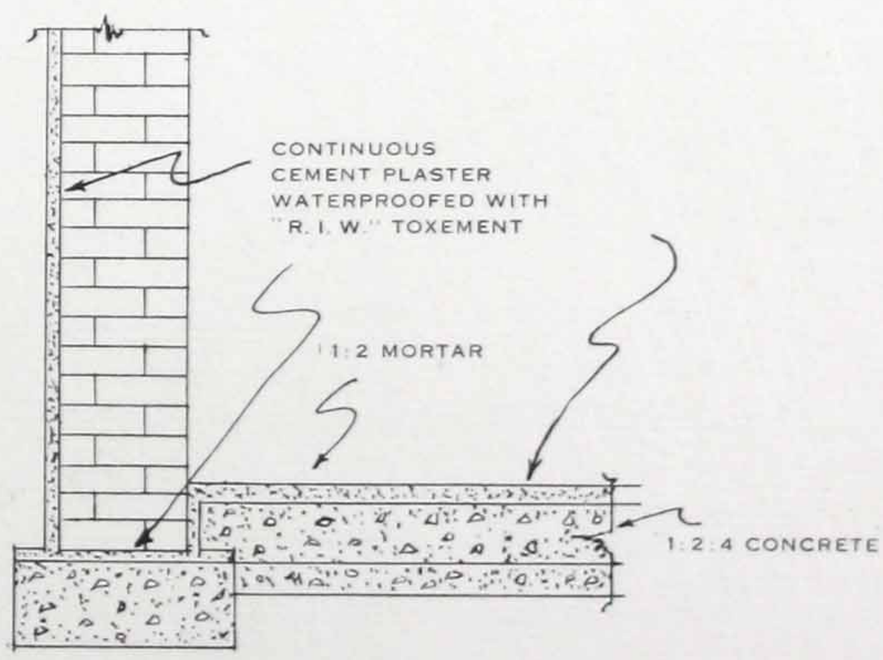


FIGURE 4

Concrete in Sea Water

It is a fact now established beyond question that concrete subject to contact with sea water undergoes disintegration under certain circumstances.

Technologic Paper No. 12 of the Bureau of Standards on the "Action of the Salts in Alkali Water and Sea Water on Cements," states that:

> "Hydraulic cement is readily decomposed if intimately exposed to the chemical action of various sulphate and chloride solutions as contained in saline and alkaline waters, if the solutions are of sufficient strength."

and also says:

> "The cause of this disintegration is not certain, though it is almost universally believed that it is the reaction of the sulphate of magnesium of the sea water with the lime of the cement (formed during setting)."

It also states that:

> "The most soluble element of the cement is lime," and that the action is more vigorous in set cements than in unset cements because,
>
> "In set cements a considerable part of the lime has been already hydrated."

The further statement is made that,

> "Contrary to the opinion of the many, there is no apparent relation between the chemical composition of a cement and the rapidity with which it reacts with sea water."

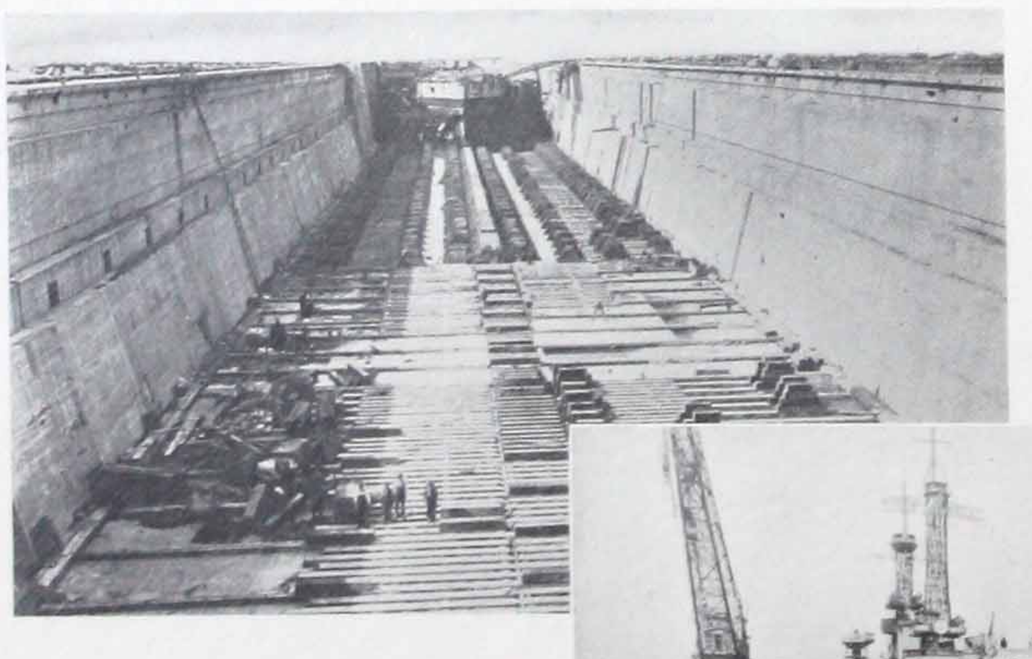
These findings have been confirmed by other investigators and establish that the ultimate cause of disintegration of concrete by sea water is the reaction of the sulphate and chloride solutions of the water with the free lime present in the concrete.

Investigation has further disclosed that when this disintegration does occur, it is principally where the concrete is alternately wet and dry, as between the high and low water marks; but in some cases, even under these conditions, disintegration does not occur. The question arising then is: if concrete contains an element, lime, which is disastrously affected by elements in sea water, why does disintegration occur chiefly only where the concrete is alternately wet and dry, and even then does not always occur? The answer appears to be comparatively simple, and can be summed up in one word—porosity.

It would seem that sea water in its normal condition is not sufficiently strong in the sulphate and chloride solution to start this chemical action. If, however, the concrete is porous, each flushing fills the pores and each drying out leaves a minute deposit of the salts. This process repeated indefinitely, eventually produces a sufficiently concentrated solution in the pores to produce the chemical reaction and accompanying crystallization which disrupts the concrete. This action has been found to penetrate deeply into the concrete—as much as four or five feet.

It is perfectly clear then, that if concrete can be made non-porous it will not be subject to this action of concentrated solutions and will therefore be stable in sea water. Extensive investigations have confirmed this contention.

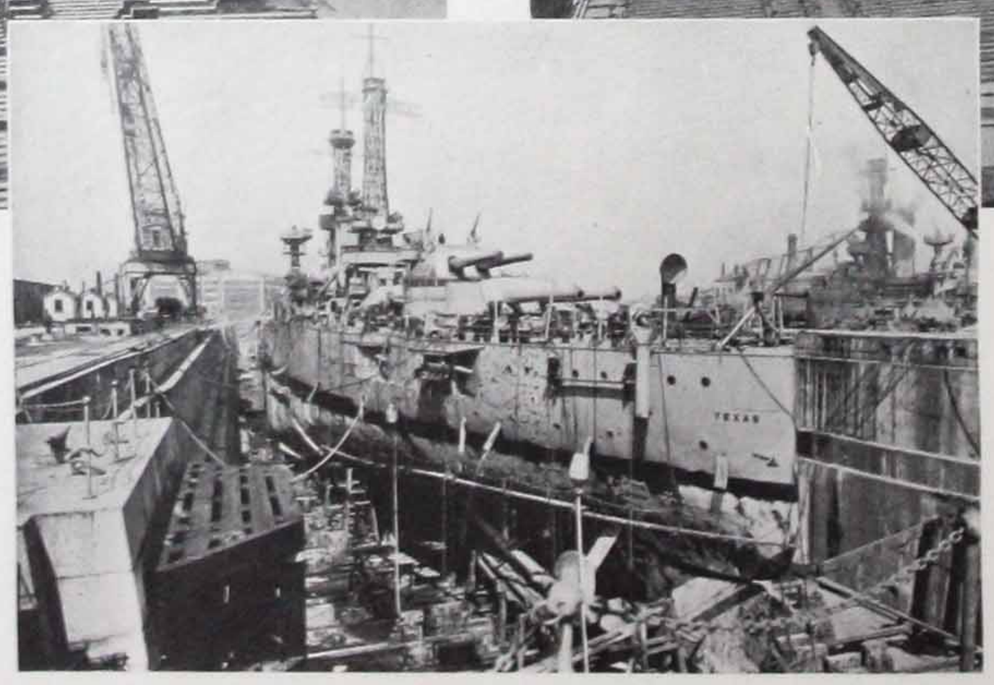
"R. I. W." Toxement, by rendering concrete non-porous, prevents disintegration by sea water.

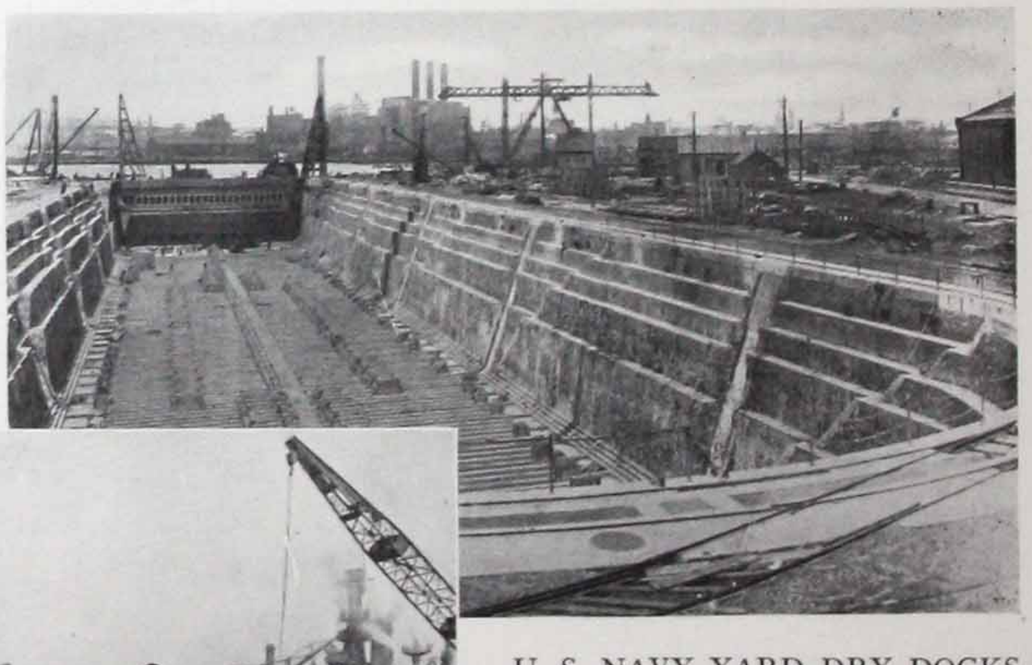


(Above)

Philadelphia. Another one of the five U. S. Navy Yard dry docks waterproofed with "R. I. W." Toxement.

The specifications required the use of an integral waterproofing compound. Toch Brothers' "R. I. W." Toxement was selected and millions of pounds were used because of the known dependability of this product.





U. S. NAVY YARD DRY DOCKS

(Above)

Dry Dock No. 4, New York. Length, 703 feet; width at top, 130 feet; depth from coping to bottom, 42 feet.

(Left)

Dry Dock No. 4, Norfolk. Length, 1,022 feet. This dry dock is one of the two dry docks in the world in which the Leviathan and the Majestic can be docked; the other being at Boston.

Stucco and Cement Mortar

What has preceded has referred exclusively to the problem of the correction of the porosity of concrete as mixed and placed under the usual field conditions. This problem pertains chiefly to the elimination of pores of appreciable size caused by friction of the particles, pocketing of air and water, or in other words, the elimination of permeability.

In cement mortars, however, the problem is of a somewhat different nature. Here we have intimately mixed finely particled materials applied under pressure, and the porosity becomes practically capillarity, and the entrance of water is mainly through absorption. The solution of the problem is then to be sought through the correction of absorption. For this purpose, "R. I. W." Toxement is put up in paste form, possessing characteristics which differ somewhat from those of the powdered form, and for the waterproofing of stucco and mortar we recommend the use of 2 per cent. of "R. I. W." Toxement Paste in all coats.

The addition of "R. I. W." Toxement Paste will impart better working quality without the use of excess mixing water, and thus increase the strength and quality of the cement mortar or stucco. On account of the lubricating qualities which this material possesses, the addition of lime is not recommended, as the function of lime is chiefly to impart plasticity or working quality. This effect can be obtained by the use of "R. I. W." Toxement Paste, and in addition the mortar or stucco is waterproofed thoroughly.

Specifications

For the Integral Waterproofing of Stucco and Cement Mortar with "R. I. W." TOXEMENT PASTE

(a) General:

All exterior stucco and cement plastering shall be waterproofed by the use of "R. I. W." Toxement Paste, as manufactured by and in accordance with the directions of Toch Brothers, Inc., New York, N. Y.

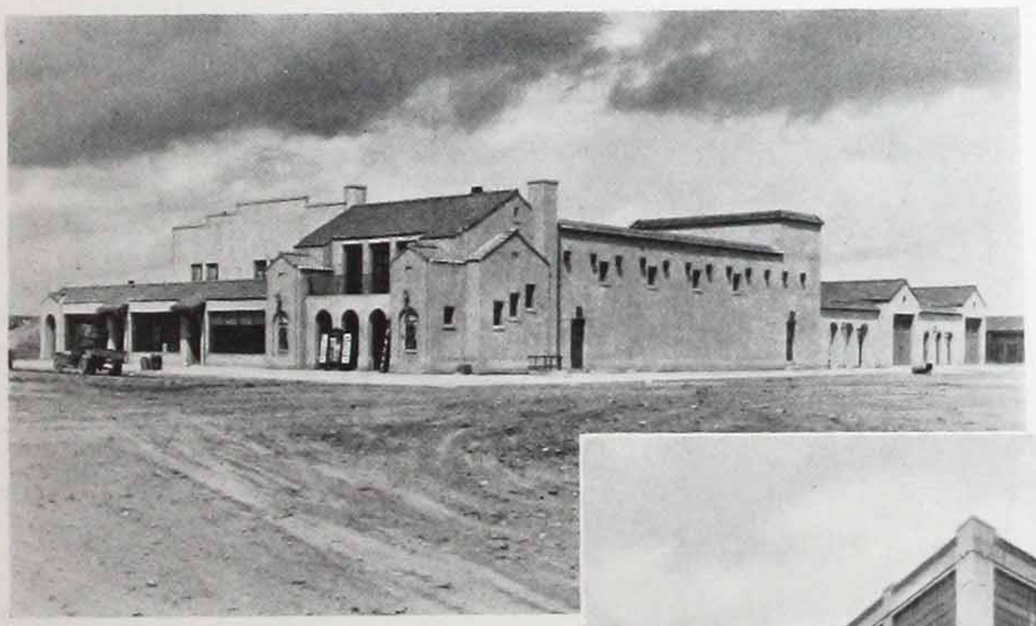
(b) Proportions:

The "R. I. W." Toxement Paste shall be used in the proportion of two per cent., by weight, of the amount of neat portland cement used.

(c) Directions for Use:

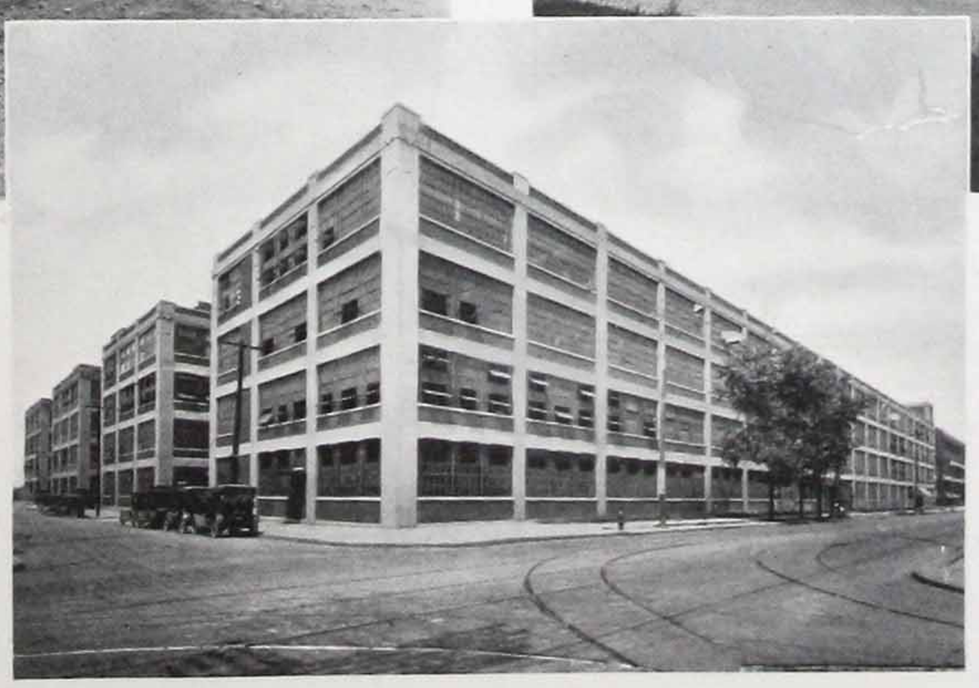
The required amount of "R. I. W." Toxement Paste shall be thinned down in the porportion of two pounds to a gallon of gauging water before adding it to the mix (here the architect or engineer will specify the balance of the aggregate and the method of completing the mixture).

The requisite amount of "R. I. W." Toxement Paste shall be incorporated in all coats.



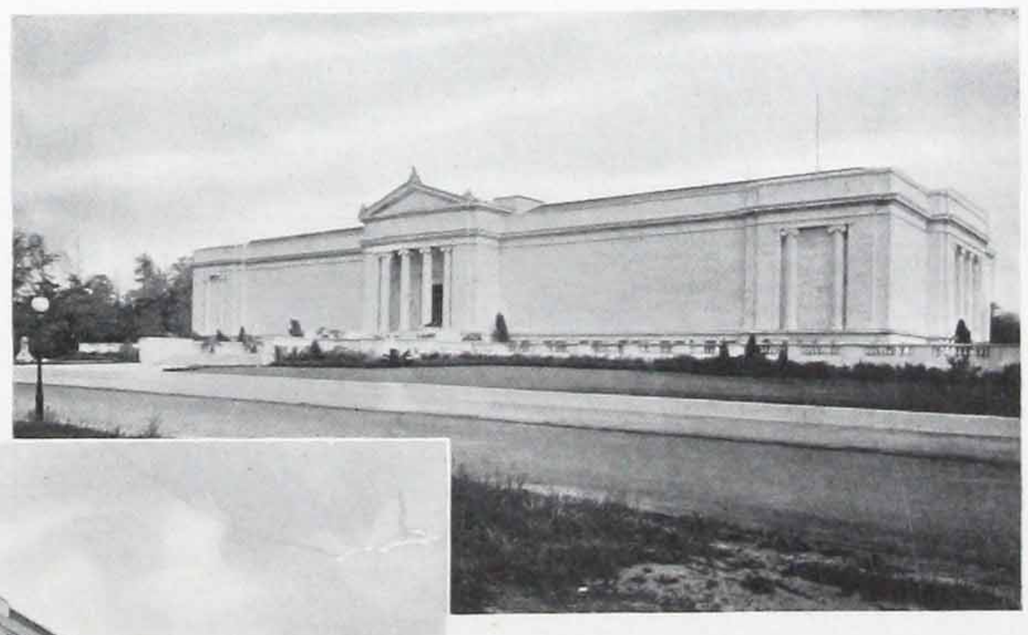
(Above) BLDG. PRODUCERS & REFINERS CORP., PARCO, WYO.
W. E. & A. A. Fisher, *Architects*

One of a group of sixteen (16) houses waterproofed with "R. I. W." Toxement.



(Top—right) CLEVELAND (O.) MUSEUM OF ART, WADE PARK
Hubbell & Benes, *Architects*

Concrete foundations waterproofed with "R. I. W." Toxement. Cut stone stain-proofed with No. 110 "R. I. W."



(Left) HUPP MOTOR CORPORATION'S MAIN PLANT, DETROIT, MICH.

Everett Winters Co., *Gen'l Cont.*

Illustration shows part of two units, each consisting of three buildings, the first completed in 1920 and the second in 1922–23. Concrete waterproofed with "R. I. W." Toxement. All exterior work given uniform color and finish with "R. I. W." Liquid Konkerit.

No. 421 "R. I. W." Acidproof Toxement is a special grade of "R. I. W." Toxement, in dry powder form, usually used in conjunction with "R. I. W." Acidproof Filler, for acidproofing and waterproofing concrete storage tanks in which oils or acid solutions are stored; bins, floors, walls, foundations, and footings, and other concrete surfaces.

Has been used successfully to protect from disintegration concrete bins in which nitre cake containing 30 per cent. free sulphuric acid is stored; concrete foundations, footings, walls and floors of a large chemical plant erected on meadow land saturated with water which was found to contain Nitric, Hydrochloric and Sulphuric Acids and Phenol; concrete oil tanks of some of the largest oil producing companies, and in chemical plants in which acids are spilled on concrete floors.

Should be used in the proportion of two pounds to every 94-pound bag of neat portland cement.

Specifications

No. 421 "R. I. W." ACIDPROOF TOXEMENT

Same as for regular grade of "R. I. W." Toxement, on page 7.

WOOLWORTH BUILDING, NEW YORK, N. Y.

CASS GILBERT, *Architect;* THOMPSON STARRETT CO., *Builders*

Concrete foundations waterproofed with "R. I. W." Toxement. Grillage beams, structural steel building frame and metal lath protected with No. 110 and No. 112 "R. I. W." Concrete floors decorated and dust-proofed with "R. I. W." Cement Filler and Cement Floor Enamel. "R. I. W." Verte Antique used on the copper dome.

HOTEL PENNSYLVANIA, NEW YORK, N. Y.

MCKIM, MEAD & WHITE, *Architects*

Concrete foundations waterproofed with "R. I. W." Toxement; cut stone backed with No. 110 "R. I. W." Cement floors in roof cafe and elsewhere decorated with "R. I. W." Cement Colors. Other "R. I. W." Protective Products were used for damp-proofing the walls, enamelling bathrooms and machinery and for other purposes.

Quantities of "R. I. W" Toxement, Neat Portland Cement, Fine Aggregate and Coarse Aggregate Required for One Cubic Yard of Compact Mortar or Concrete

COMPILED FROM DATA SUPPLIED BY PORTLAND CEMENT ASSOCIATION

Mixtures			Quantities of Materials					"R. I. W." Toxement
				Fine Aggregate		Coarse Aggregate		Waterproofing
Cement	Fine Aggregate	Coarse Aggregate (Gravel or Stone)	Cement in 94-lb. Sacks	Cu. Ft.	Cu. Yd.	Cu. Ft.	Cu. Yd.	Pounds
1	1.5	..	15.5	23.2	0.86	....	....	31
1	2.0	..	12.8	25.6	0.95	....	....	25.6
1	2.5	..	11.0	27.5	1.02	....	....	22
1	3.0	..	9.6	28.8	1.07	....	....	19.2
1	1.5	3	7.6	11.4	0.42	22.8	0.85	15.2
1	2.0	3	7.0	14.0	0.52	21.0	0.78	14
1	2.0	4	6.0	12.0	0.44	24.0	0.89	12
1	2.5	4	5.6	14.0	0.52	22.4	0.83	11.2
1	2.5	5	5.0	12.5	0.46	25.0	0.92	10
1	3.0	5	4.6	13.8	0.51	23.0	0.85	9.2

"Toxement" Measuring Cup

Materials Required for 100 Sq. Ft. of Surface for Varying Thicknesses of Concrete or Mortar

Proportion	1 : 1½			1 : 2			1 : 2½			1 : 3		
Thickness in Inches	Cement in 94-lb. Sacks	Fine Aggregate (Sand)	"R. I. W." Toxement 2% (2 lbs. to Each Sack of Cement)	Cement in 94-lb. Sacks	Fine Aggregate Sand	"R. I. W." Toxement 2% (2 lbs. to Each Sack of Cement)	Cement in 94-lb. Sacks	Fine Aggregate (Sand)	"R. I. W." Toxement 2% (2 lbs. to Each Sack of Cement)	Cement in 94-lb. Sacks	Fine Aggregate (Sand)	"R. I. W." Toxement 2% (2 lbs. to Each Sack of Cement)
⅜	1.8	2.7	3.6	1.5	3.0	3	1.3	3.2	2.6	1.1	3.4	2.2
½	2.4	3.6	4.8	2.0	4.0	4	1.7	4.3	3.4	1.5	4.4	3
¾	3.6	5.4	7.2	3.0	6.0	6	2.5	6.3	5	2.2	6.8	4.4
1	4.8	7.2	9.6	4.0	7.9	8	3.4	8.4	6.8	3.0	8.9	6
1¼	6.0	9.0	12	4.9	9.9	9.8	4.2	10.5	8.4	3.7	11.1	7.4

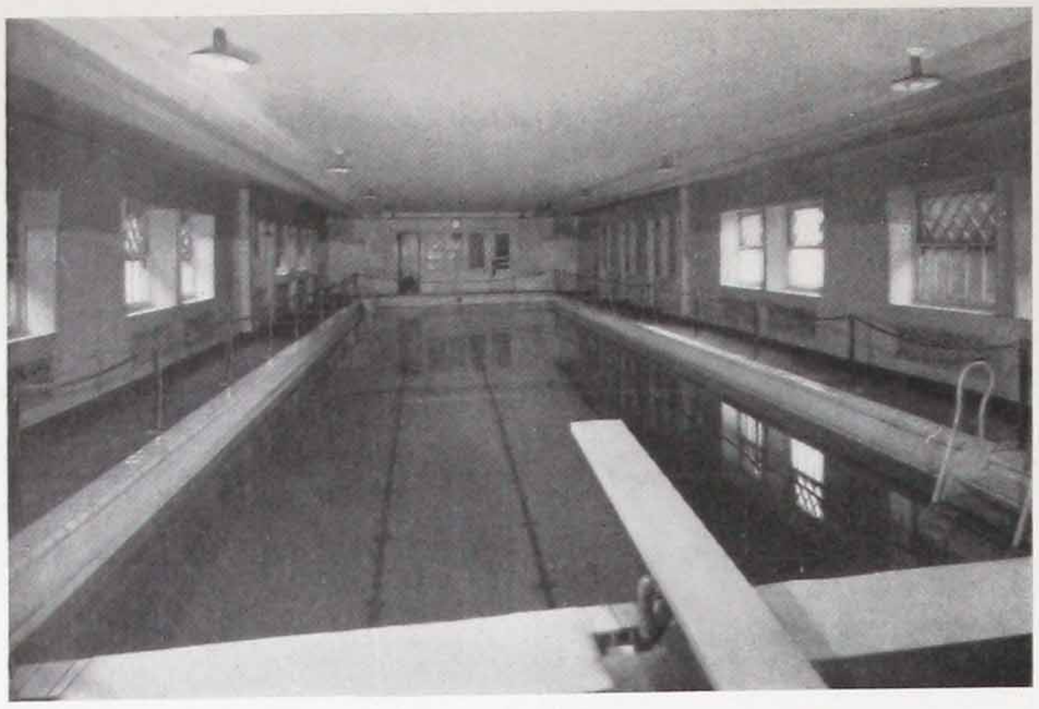
	1 : 2 : 3				1 : 2 : 4				1 : 2½ : 4				1 : 2½ : 5			
	Cement in 94-lb. Sacks	Fine Aggregate (Sand)	Coarse Aggregate (Pebbles or Broken Stones)	R. I. W. Toxement 2% (2 lbs. to Each Sack of Cement)	Cement in 94-lb. Sacks	Fine Aggregate Sand	Coarse Aggregate (Pebbles or Broken Stones)	R. I. W. Toxement 2% (2 lbs. to Each Sack of Cement)	Cement in 94-lb. Sacks	Fine Aggregate Sand	Coarse Aggregate (Pebbles or Broken Stones)	R. I. W. Toxement 2% (2 lbs. to Each Sack of Cement)	Cement in 94-lb. Sacks	Fine Aggregate (Sand)	Coarse Aggregate (Pebbles or Broken Stones)	R. I. W. Toxement 2% (2 lbs. to Each Sack of Cement)
3	6.5	13.0	19.3	13	5.6	11.2	22.4	11.2	5.2	12.9	20.6	10.4	4.6	11.5	23.0	9.2
4	8.6	17.2	25.8	17.2	7.5	14.9	29.8	15	6.9	17.1	27.5	13.8	6.2	15.4	30.7	12.4
5	10.8	21.6	32.2	21.6	9.4	18.7	37.4	18.8	8.6	21.5	34.3	17.2	7.7	19.2	38.3	15.4

1 sack or bag of cement (94 pounds) = 1 cu. ft.; 4 sacks = 1 bbl.

Based on tables in "Concrete, Plain and Reinforced," by Taylor and Thompson.

The quantities given in these tables are approximate, and allowance must be made for the character of the sand and its moisture content, also for waste and for keys behind the lath.

No allowance made in table for waste.



SWIMMING POOL
CITY ATHLETIC CLUB, NEW YORK, N. Y.
HENRY B. HERTS, *Architect*

"R. I. W." Toxement used for waterproofing swimming pool. "R. I. W." Hospital and Laboratory Enamel used on walls and ceilings of pool and showers. This hard usage enamel is waterproof and may be readily cleansed with any neutral soap and warm or cold water.

NEW COLONIAL HOTEL, NASSAU, BAHAMAS
KENNETH MURCHISON, *Architect*

The "R. I. W." Toxement Mortar Paste used to waterproof the stucco, the No. 232 "R. I. W." used for damp-proofing all exposed walls and the No. 163 "R. I. W." Oak Cement Color used for coloring the concrete lintels of this unique and artistically conceived hotel are but three products of an extensive line of "R. I. W." Preservative Paints and Compounds.

BROWN HOTEL, LOUISVILLE, KY.
PRESTON J. BRADSHAW, *Architect and Builder*

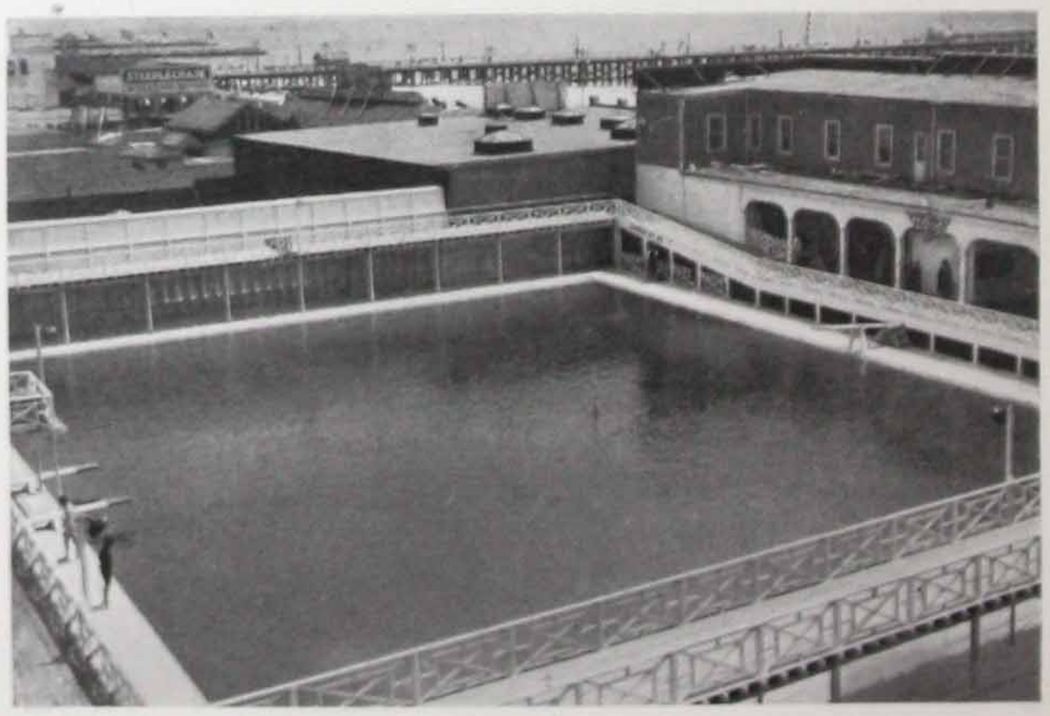
Foundation walls and basement floors waterproofed with "R. I. W." Toxement, which is prolonging the life and usefulness of many famous structures in all parts of the world.

FIRST PRESBYTERIAN CHURCH, MARION, VA.

All of the pre-cast concrete trim used on this building was made by the Watauga Cement Products Corp. This concern uses "R. I. W." Toxement for waterproofing all their stone, and "R. I. W." Toxloxpore to prevent discoloration by atmospheric conditions.

OAK RIDGE GOLF CLUB, TUCKAHOE, N. Y.
BALL & SNYDER, *Engineers*

Reinforced concrete bridge waterproofed with "R. I. W." Toxement, which lubricates concrete and enables it to settle into a dense, impenetrable mass. "R. I. W." Toxement is furnished in dry powder form for mass concrete construction, and in paste form for stucco and cement mortar.



WASHINGTON BATHS, CONEY ISLAND, N. Y.
JACOB SCHLESINGER, INC., *Engineers and Architects*

Users of "R. I. W." Toxement secure two-fold results. They make concrete work permanently waterproof and save money by speeding up the job. "R. I. W." Quick Done also was used on this work to lower the freezing point and accelerate the setting time.

TOCH BROTHERS'

R.I.W. PROTECTIVE PRODUCTS

REMEMBER IT'S WATERPROOF

Reg. U. S. Pat. Off.

Comprise a complete line for the preservation and decoration of wood, metal, plaster, concrete and other surfaces, and include:

TECHNICAL PAINTS
CONCRETE FLOOR COATINGS
WATERPROOFING COMPOUNDS
DAMP-RESISTING PAINTS
CEMENT AND MORTAR COLORS
STEEL PRESERVATIVE PAINTS
INTERIOR WALL COATINGS
ENAMELS, VARNISHES
SPECIALTIES

Steel Need Not Rust! Wood Need Not Rot! Nor Concrete Dust!

Interesting and informative literature sent upon request